No. IX.

DETACHED ESCAPEMENT.

The LARGE SILVER MEDAL *was presented to Mr.* WM. MELVINE, *for his Detached Escapement for Chronometers: a Model of which has been placed in the Society's Repository.*

22, *Ironmonger Lane, Cheapside,*
SIR, *April* 6, 1828.

I BEG to lay before you a model of an invention, which has for its object the rendering the balance of chronometers totally independent on the train, and which is different from any plan which, as far as I know, has hitherto been laid before the public. In this escapement, the impulse is given by the unbending of a spring, and this spring is rebent every time the balance performs its motion. One of the peculiarities of this escapement is, that the *balance* does *not* lift the detent from the teeth of the escapement wheel, as is the case in all other escapements. This is done by the spring, but not *till* the balance has received its impulse; and thus an important advantage is gained, as the motion of the balance can neither be accelerated nor detained by any irregularities in the train. This will be seen at once, on examining the model. The pallat, which gives the impulse, is kept in its place by being allowed to go a little past the centres of the pivots by which it is connected with the spring. The balance has to bring it to the centre, and then it receives its impulse. As soon as the pallat gives the

impulse to the balance, and is *completely freed from it*, it unlocks the detent, and is instantly placed, by the action of the train, in its former place, where it remains till the balance comes round again. It appears, therefore, that it is of no consequence to the balance whether the power of the train be great or small, provided it has sufficient force to bend the spring. This is shewn in the model, in which, having no fusee, the action of the main spring must be very unequal. I must, however, remark, that the model shews the invention in its simplest and rudest form, and of course to a very great disadvantage; and it will be perceived that, should it come into use, much improvement may be effected in the arrangement of its parts by any *practical* watchmaker. Living in a country town in Scotland, I found that I could not get a time-piece on the principle made to my mind; I have, therefore, satisfied myself with the present model, which is the *first* embodying of the plan; and being in London, I take the opportunity of presenting the model, and shall feel proud if it is thought worthy of a place in the Repository of the Society of Arts.

I am, Sir,

&c. &c. &c.

A. Aikin, Esq.
Secretary, &c. &c.

William Melvine.

Reference to the Engraving. Plate III.

Fig. 1 and 2 front views, and fig. 3 a side view of the escapement; *a* the escape wheel; *b*, fig. 3, the pallat arbor; *c* the balance; *d* the locking detent; *e*, figs. 3,

4, 5, and 6, the pallat spring: it gives the impulse to the balance, and by means of the peculiar manner in which it is connected to the pallat arbor *b*, by the arched piece *f* and short arm *g*, it becomes self-locked. The action of this spring is always from the pallat arbor, as shewn by the arrows: in figs. 3 and 4 it is in the neutral position, its action being against the arbor; and when the train, acting through the tooth *h* against the pallat *i*, has brought the pallat or impulse lever *j* past the neutral point, towards the position shewn in figs. 1 and 5, the spring *e* brings it to that position, and holds it there: the tooth *k* then rests against the detent *d;* the balance pin *l*, fig. 1, in vibrating from *m*, has passed the very slender spring *n*, which gives way to let it pass: being fastened at *o*, and being free in all that length, its resistance is as nothing; but, on the balance returning, the pin *l* comes on the other side of the spring *n*, (which is prevented from yielding this way, it being backed by a stop *p*, shewn in fig. 7), and carries the lever *j* with it, which raises the arm *g* from its position fig. 5, till it passes the neutral position fig. 4; the spring *e* then carries the lever *j* quicker than the balance was moving, and therefore gives an impulse to it by pressing against the pin *l*, till it comes to the position figs. 2 and 6, where it has just passed the pin *l*, before the train is unlocked: the balance is, therefore, perfectly detached, and continues its course, for it is only by the further motion of the lever *j* and pallat *q* that the detent *d* is raised, as shewn by the dotted lines fig. 2; the spring *e* cannot act farther than to unlock by raising the detent *d*, the pallat *q* resting against the detent pin *r*, (shewn separate in fig. 8), and the detent is detained by its stops *s s;* but the moment the tooth *k* escapes, the tooth *t* presses against the pallat *i*, and instantly brings back the lever *j*

to the position fig. 1, where the spring *e* holds it, as shewn in fig. 5: the connecting piece *f* rests upon the collet of the arm *g*, when the lever *j* is brought to the right position, the collet *g* and the detent stop *s* limiting the motion of the impulse lever *j* to the left and right. Thus the impulse given to the balance is always a perfect repetition of the same action of the spring *e;* and whilst the impulse lever *j* is moving from the position fig. 4 to that in fig. 2, all the work the balance has to do is to raise the arm *g* from the position fig. 5 to that of fig. 4, which is a perfect repetition of the same motion, the balance never having any thing to do with the train, or with any inequality producible thereby, for on returning, it always finds the lever *j* and spring *e* in the same quiescent state, and the pallats totally unconnected with the train; the balance merely liberates the spring *e*, receives an impulse from it, and goes on; the spring *e* having left the balance, unlocks the train, or lets one tooth escape, which immediately returns the lever *j* to the first position, where the balance again finds it.